



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/923,842	08/07/2001	Mindaugas F. Dautartas	ACT-142 (1117-6)	2026

110 7590 10/14/2003

DANN, DORFMAN, HERRELL & SKILLMAN
1601 MARKET STREET
SUITE 2400
PHILADELPHIA, PA 19103-2307

EXAMINER

BRYANT, DAVID P

ART UNIT	PAPER NUMBER
----------	--------------

3726

DATE MAILED: 10/14/2003

14

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/923,842

Applicant(s)

DAUTARTAS ET AL.

Examiner

David P. Bryant

Art Unit

3726

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 15-23 is/are pending in the application.
- 4a) Of the above claim(s) 15-17 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 18-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Art Unit: 3726

DETAILED ACTION

Election/Restrictions

This application contains claims 15-17 drawn to an invention nonelected with traverse in Paper No. 10. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Newly submitted claim 23 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

Claim 23 is directed to the distinct embodiment disclosed on page 22, lines 1-5, of the specification, wherein a series of tabs are substituted for the alignment members **40a** and **40b** depicted in the Figures.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 23 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art (AAPA) in view of Lehman et al. (U.S. Patent No. 6,095,697).

AAPA is found on page 4 of the specification, and depicted in Figures 1 and 2 of the Drawings. As shown in Figure 1, passive alignment of micro-chips typically is done using complementary micromachined grooves or cavities **22/32** in conjunction with one or more alignment spheres or ball lenses **40**. Although this method is satisfactory for “frontside to frontside” alignment, in the case of a “frontside to backside” configuration of chips **20** and **30**, as shown in Figure 2, it is difficult to provide the necessary backside alignment between micro-components positioned on the chips. Figure 2 depicts the micro-components as lenses **50** and grooves **32**, but applicant discloses (e.g. on page 2 of the specification) that the micro-components may also comprise optical fibers.

Therefore, simply stated, AAPA fails to teach a micro-chip assembly, an aligning apparatus, or a method for frontside to backside alignment of two micro-chip substrates, each having a front surface facing the same direction and at least one depression thereon for engagement with at least one alignment element.

Lehman et al. teach a method of micro-chip alignment wherein “frontside to backside” alignment is required between a first substrate **25** and a second substrate **19** to align a micro-component **12** disposed on the first substrate with the second substrate. The second substrate includes a periphery which extends beyond the periphery of the first substrate. To provide the necessary alignment, an aligning apparatus **20** includes positioning features **23** and **22** thereon which engage with corresponding positioning features **16** and **24** disposed on the first and second substrates, respectively. When the positioning features are engaged—**22** with **24** and **23** with

Art Unit: 3726

16—the micro-component 12 on the first substrate is accurately aligned with second substrate 19. After achieving alignment, the substrates are bonded together with solder or adhesive 43, maintaining a slight gap between the substrates. Thereafter, the aligning apparatus 20 is removed from the bonded substrates.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided the second substrate with a periphery which extends beyond the periphery of the first substrate, and to have used an alignment device in conjunction with positioning features on the first and second substrates, as taught by Lehman et al., to provide the necessary backside alignment between micro-lenses 50 and grooves 32.

Although Lehman et al. utilize ball/socket and keyed surfaces as positioning features, it is well known in the art, as exemplified by Figure 1 of applicant's Drawings, to use micromachined grooves and alignment spheres (or cylinders) as passive positioning features in micro-chip assemblies, and to substitute these positioning features for those utilized by Lehman et al. is deemed to have been an obvious matter of design choice.

The limitations in claims 6 and 11 are deemed to have been obvious matters of design choice, since applicant has not disclosed that depressions created by raised surfaces solves any stated problem attributable to micromachined grooves, and it appears that depressions in either form would perform equally as well.

Response to Arguments

Applicant's arguments filed August 21, 2003, have been fully considered but they are not persuasive.

Applicant argues that the proposed combination of Figures 1 and 2 (AAPA) with Lehman relates to **frontside to frontside** alignment, not the **frontside to backside** alignment of applicant's claimed invention. In support of this argument, applicant points out that Lehman aligns a microcomponent **12** disposed on the first substrate **25** with respect to a second substrate **19** (rather than with respect to *a microcomponent* disposed on the second substrate). This is not convincing. Applicant's Figure 2 depicts a typical frontside to backside alignment, and the inherent problems associated therewith. In Figure 2, a first substrate **20** includes a microcomponent **50** thereon which must align with a microcomponent **32** on a second substrate **30**. However, this is equivalent to saying that microcomponent **50** must align with *a specific location* (i.e. the precise location at which the microcomponent **32** is positioned) on second substrate **30**. This is exactly the situation in Lehman, wherein microcomponent **12** must be aligned with a specific location on substrate **19**. This location is ensured by the engagement of the alignment devices and positioning features of Lehman, just as is the case with applicant's corresponding elements in Figures 3-5. Since it is known from Lehman to align a microcomponent on a first substrate with a specific position on a second substrate, it would have been obvious to one of ordinary skill in the art that that specific position could just as easily be the position at which a microcomponent is located, as is the case in AAPA. The fact that Lehman does not explicitly teach a microcomponent on the second substrate does not in itself render its combination with AAPA improper, especially since AAPA teaches microcomponents on both the first and second substrates.

Applicant's remaining argument with respect to the holder **26** of Lehman is moot, since that embodiment of Lehman is not being relied upon in the present rejection.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Telephone inquiries regarding the status of applications or other general questions, by persons entitled to the information, should be directed to the group clerical personnel. In as much as the official records and applications are located in the clerical section of the examining groups, the clerical personnel can readily provide status information. M.P.E.P. 203.08. The Group clerical receptionist number is (703) 308-1148.

If in receiving this Office Action it is apparent to applicant that certain documents are missing, e.g., copies of references cited, form PTO-1449, form PTO-892, etc., requests for copies of such papers or other general questions should be directed to Tech Center 3700 Customer Service at (703) 306-5648, or fax (703) 872-9301 or by email to CustomerService3700@uspto.gov.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **David Bryant** whose telephone number is **(703) 308-1859**. Draft amendments or proposed changes to the application may be faxed directly to the examiner at any time via RightFAX at (703) 746-4213. The examiner can normally be reached on **Mondays-Thursdays from 6:30 AM to 5:00 PM**.

Art Unit: 3726

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Vidovich can be reached on 703-308-1513. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1148.

Other helpful telephone numbers are listed for applicant's benefit.

Allowed Files & Publication	(703) 308-6789 or (888) 786-0101
Assignment Branch	(703) 308-9723
Certificates of Correction	(703) 305-8309
Drawing Corrections/Draftsman	(703) 305-8404/8335
Petitions/Special Programs	(703) 305-9285
Terminal Disclaimers	(703) 305-8408
PCT Help Desk	(703) 305-3257

If the information desired is not provided above, or a number has been changed, please call the general information help line below.

Information Help line	1-800-786-9199
Internet PTO-Home Page	http://www.uspto.gov/



David P. Bryant
Primary Examiner
Art Unit 3726